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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference P637 PC00	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/DK 03/00520	International filing date (day/month/year) 01.08.2003	Priority date (day/month/year) 01.08.2002
International Patent Classification (IPC) or both national classification and IPC B01D3/38		
Applicant GREEN FARM ENERGY AS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24.02.2004	Date of completion of this report 01.09.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Nissen, V Telephone No. +49 89 2399-8619 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/DK 03/00520**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1-72 as originally filed

Claims, Numbers

1-100 as originally filed

Drawings, Sheets

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-100
	No: Claims	
Inventive step (IS)	Yes: Claims	1-100
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-100
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/DK 03/00520

1. The present invention pertains to processing liquid medium containing volatile compounds. More specifically it pertains to removing ammonia from a water stream and/or a fermenter in connection with the production of biogas. By removing the volatile substances these can be kept at levels where they have no or only little inhibitory effect on the micro organisms.
- 1.1 The invention involves means for (claims 1, 18 and 19) and steps adapted to (claims 68 and 69) diverting a liquid side stream comprising volatile components from a fermenter to a shunt in which the volatile components are removed using "cold" (i.e. at reduced pressure) steam from an evaporator by driving the steam through the liquid. The steam is subsequently condensed in a first condenser and the resulting liquid is stripped for volatile components in a stripper using "hot" steam. The resulting steam is condensed in a second condenser.
- 1.2 As none of the documents cited in the International Search Report appear to disclose means or steps suitable for producing "cold" steam and driving said steam through a liquid medium as defined in the independent claims, the subject matter of all claims is novel (Art. 33(2) PCT).
- 1.3 The invention relies on the acknowledgment that micro organisms can accept low pressure rather than high temperature. By using cold steam for shunting (i.e. a first stripping step) more viable micro organisms remain after treatment.
- 1.4 Although the above acknowledgment seems obvious in hindsight there is apparently no hint in the cited prior art towards the measures as defined or there possible positive effects. Accordingly also the presence of an inventive step has been acknowledged (Art. 33(3) PCT).
- 1.5 Industrial applicability in the art of biogas production is self-evident (Art. 33(4) PCT).
2. The present application comprises three independent apparatus claims, two independent process claims and a total of 100 claims. Taking the nature of the invention into consideration the present number of claims is considered to be excessive (R. 6.1(a) PCT) and should be reduced to a minimum number of independent claims comprising all essential features of the invention (R. 6.3(a) PCT) followed by a limited number of dependent claims defining the optional features of preferred embodiments (R. 6.4 PCT).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/DK 03/00520

- 2.1 Claims 18 and 19 are considered de facto dependent on claim 1 as they contain all features of said claim.
- 3. The expressions "cold" and "hot" steam are not per se clear (Art. 6 PCT). The description comprises suitable definitions.
 - 3.1 Step a of claim 1 is not clear in respect of from and to where the side stream is conducted (Art. 6 PCT).
 - 3.2 There seems to be an inconsistency in claim 68 between the use of the expressions "at least a part of" and "essentially all" in respect of the volatile components (Art. 6 PCT). In any event the term "essentially" is unclear (Art. 6 PCT).
 - 3.3 Several of the apparatus claims refer to what is in the tanks, the nature of various components and/or to the operating pressures during the optional use of the apparatus. It is not evident how these features are evident from the apparatus per se (Art. 6 PCT). Such claims are essentially considered superfluous [vide item 2 above] unless the applicant actually intends to define the apparatus during use.
 - 3.4 In several apparatus claims verbs in presence is used for defining how various elements are supposed to work. Such statements are not limiting on an apparatus per se beyond it being "suitable for" such operation.